

Toward quantitative reconstruction of precipitation during the latest Holocene using the sediment of Lake Suigetsu

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Lake Suigetsu in Fukui Prefecture, central Japan is characterized with deep depth relative to its small size and composition of accumulating sediment particles differs according to season. Because of these characteristics, Lake Suigetsu has annually laminated sediment (varve) continued since 70000yr B.P. In previous SG93 and SG06 projects, high resolution 14C datings of fossil leaves sampled from the sediment were conducted to construct extremely high quality age model. In SG 12 project, we drilled new sediment cores aiming to re-construct paleo-climatic changes such as precipitation and westerly jet path with high precision and high time resolution.

Lake Suigetsu has no direct feeder river. Fine suspended particles flow into Lake Suigetsu indirectly through Lake Mikata from Hasu River. Aeolian dust from the Asian Continent also contribute detrital supply to the sediment of Lake Suigetsu. There could be an additional source of detrital materials, which is supplied from the marginal part of the Lake by reworking due to earthquakes. However, the method to distinguish these clastic materials from different sources in the sediment cores are not yet established.

There are several previous researches to based on the lake Suigetsu sediments, such as pollen analysis and identification of flood events based on composition of clay minerals. However, quantitative reconstruction of precipitation has never been conducted.

In this study, we are going to quantitatively reconstruct the past precipitation of this region using the relationship between precipitation and flux of suspended matters in river water.

More specifically, we will re-construct temporal changes in the flux of suspended particles from Hasu River during the last 100 years or so. Then we compare the obtained detrital fluxes from Hasu River to Lake Suigetsu with observational precipitation record around the area to derive the relationship between the annual precipitation and the flux of suspended detrital particles from Hasu River.

Because there must be multi sources of detrital materials to the sediment in Lake Suigetsu, we will conduct end member analysis using mineral and elemental compositions of the sediment. Then we will compare the composition of these end members with those of possible sources such as aeolian dust, suspended particles from Hasu River, and sediments delivered from surrounding slopes of Lake Suigetsu.

Keywords: reconstruction of precipitation, annual laminated sediment (varve), suspended particles, lake Suigetsu, paleo-climate